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*Note on the Anatomy of Pontobdella verrucata (Leach).*

By L. VAILLANT.

The number of rings in the zoonite in *Hirudo* and most of the allied genera is 5; in *Pontobdella* it is 4, as was recognized by Savigny. The body of *P. verrucata* contains 10 complete zoonites in its middle part, behind the cincture; the extremities and the cincture are less regularly formed, the rings being often grouped in threes. The total number of rings is 66. In the male zoonites (the six immediately following the cincture) the testes occupy the first ring, the nervous ganglion is placed between the third and fourth, and upon the last are the muciparous pores.

Beneath the skin and muscles the body presents a thick layer of yellowish-brown glandules, the excretory canals of which may be traced to the surface; they probably endue the animal with a protective coat. The muciparous vesicles of the cincture present a ciliated inner pavilion analogous to that indicated first in the *Lumbricina*, and afterwards in the *Branchiobdellæ*.

The trunk, by which these worms suck the blood which constitutes their food, is quite unarmed, so that it probably only penetrates by separating the tissues. The œsophagus is surrounded by whitish glandules, the excretory ducts of which are directed forward, towards the anterior disk. An analogous arrangement has been indicated in *Aulastoma* by Leydig, who supposes that these glands discharge themselves at the jaws to facilitate their action; the author thinks that they have probably to do with the formation of the oviferous cocoon. The so-called *stomach*, which the author would prefer to name *ingluvies* or *crop*, is a reservoir in which the blood accumulates without undergoing any perceptible change. It is divided anteriorly into seven chambers, indicated outside by slight constrictions, and separated by incomplete septa; behind is a large cæcum to which the intestine is applied longitudinally. The intestine has two lateral dilatations at its origin, and is divided into four nearly equal parts. The walls of the *ingluvies* are formed by interlaced fibres of laminar tissue and smooth muscular fibres, without distinct glandular elements; the walls of the intestine contain a multitude of true *glandular acini*. It is here that the process of digestion commences.

The female generative apparatus consists of a long sac or cæcum, the anterior neck-like part of which terminates at a whitish body of glandular aspect. From this starts a duct which unites with that of the opposite side, to open by a single median aperture. The glandular organ likewise receives from five to seven ducts on its inner surface; and these the author believes come from the transparent glands which occur at some parts, mixed with the yellowish subcutaneous glandules. This system would then have to be re-

garded as a diffused vitellogene, analogous to that indicated in other Cotylide worms.

The *Pontobdella* envelopes its ovum in a cocoon fixed by a pedicle to submarine bodies; this is figured by Hesse and Van Beneden, but from an altered specimen, unless it belongs to a different species. The animal embraces the cocoon with its anterior disk to complete and fix it. Hence, and from the facts observed in other species, the author concludes that the so-called salivary glands furnish the material for this protective envelope of the ova.—*Comptes Rendus*, July 13, 1868, pp. 77-79.

*Considerations upon the fixation of the limits between the Species and the Variety, founded upon the study of the European and Mediterranean species of the Hymenopterous Genus Polistes (Latr.).* By M. SICHEL.

I. For several years the question of the mutability or immutability of the species has been afresh brought under discussion, and vividly attracts the attention of zoologists. Nothing can contribute more to exhaust this question and to pave the way to its solution, by aiding powerfully to fix the limits between the species and the variety, than the profound study and exact statistics of certain genera of insects richly represented in individuals, and possessing a sufficient number of species common in our climates to allow us to study them on a large scale in regular and complete series. Series captured in the nests especially, by permitting the comparison of allied species and the exact observation of the transitions between each species and its varieties, will singularly facilitate our conclusions, and give them a high degree of certainty.

Such a genus is the Hymenopterous genus *Polistes*, represented in the whole of Europe, in Algeria, and in the western part of Asia by four species (three of which are very common even in the environs of Paris), viz. *P. gallicus*, *biglumis*, *diadema*, and *Geoffroyi*.

II. But these last three species are identical with *P. gallicus*, and only differ from it as varieties. It is this opinion that I endeavour to establish here by numerous and, I think, convincing proofs, in order to show for once how the study of the Hymenoptera on a large scale and on the living animal may contribute to fix the limits between the species and the variety.

III. The above four species may be well characterized; but their diagnostic characters are neither constant nor essential, as is proved by the following propositions, deduced from long-continued and accurate observations:—

1. The subvarieties are so numerous that we may at pleasure create new varieties among them.

2. The transitions between the different varieties are so frequent and so insensible that it is often impossible to say where one variety or subvariety ends, and where the next one commences.

3. In the same nest we see hatched simultaneously or successively